July 2005

Aesthetics and Professionalism of Virtual Servicescapes*

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Key words:
Aesthetics, Professionalism, E-service, Virtual servicescape, Emotion

Paper submitted for Publication in Journal of Service Research

* We thank two anonymous reviewers for their insights that helped us improve this manuscript. We also thank Techiya Ramati, Rafi Yavetz, and Dafna Vilnai for their help with this study and Caryn Schneider-Yaacov and Meira Ben-Gad for editorial assistance.
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ABSTRACT

We document the effects of the aesthetics and professionalism of virtual servicescapes on customer feelings of pleasantness, satisfaction, and approach toward service interactions. Data were collected using an experimental manipulation of the physical setting (the servicescape) viewed by customers during a service interaction in a virtual (remote) service situation. Participants interacted with the service provider and reported their reactions through a specially developed interactive program. Experimental conditions varied in the aesthetics and professionalism of the virtual servicescape in which the employee was seated and viewed.

Aesthetics were found to influence feelings of pleasantness, satisfaction, and approach toward a service interaction. In our experimental manipulation, professionalism was found to influence satisfaction, but not feelings of pleasantness or approach toward a service interaction. However, perceptions of professionalism did influence these variables. Also as predicted, feelings of pleasantness mediated the relationship between aesthetics and satisfaction and between aesthetics and approach toward a service interaction, but not the relationship between professionalism and these variables. The implications of the findings for research and practice are discussed.
INTRODUCTION

Technological developments have created new channels for both sales and service (Browne, Durrett, and Wetherbe 2004; Thompson 2002). With these developments, it has become important to understand how the design of e-commerce and e-service systems affects customer reactions (Cao and Zhao 2004; Iqbal, Verma, and Baran 2003; Kim and Lee 2002; Rahul, Lakshmi, and Salam 2003; Rust and Kannan 2002; Santos 2003; Thompson 2002; Mummalaneni 2005). One change created by the move from physical service locations to Internet or other virtual service processes is the nature of the 'servicescape' that customers encounter (Bitner 1992). We focus on this aspect of e-service.

The "servicescape" – the set of tangible, physical cues that represent an organization to its clients – has been shown to strongly influence customer behavior and satisfaction (Bitner 1992; Stone and English 1998; Wirtz and Bateson 1999; Yun et al. 2001; Mummalaneni 2005). The design of the virtual site that customers encounter in an e-service setting can be labeled the "virtual servicescape", and is likely to influence customer feelings toward, perceptions of, and inclinations to do business with an organization (Browne, Durrett, and Wetherbe 2004; Mummalaneni 2005). When sales or service encounters occur through virtual means (i.e., in a 'bricks and clicks' service setting or in a 'clicks only' setting), the servicescape may become particularly critical, because it is the key artifact representing the organization to customers (Rafaeli and Pratt 2005). This artifact is likely to invoke in customers particular images and expectations regarding the
organization (Rafaeli and Vilnai-Yavetz 2004a), producing emotional responses as well as behavioral reactions (Browne, Durrett, and Wetherbe 2004; Hall and Hanna 2004).

In this study we explore just how the virtual servicescape affects customer perceptions and reactions. Various virtual representations have been evaluated in previous research, especially with regard to their aesthetic impact and appeal (Tractinsky and Zmiri in press). However, following Rafaeli and Vilnai-Yavetz (2004a), we suggest that analysis of such representations should consider two independent and complementary dimensions – aesthetics and symbolism. Below we predict that these dimensions will influence customer satisfaction and customer approach toward a service interaction. We then examine emotion (feelings of pleasantness) as a mediator of these relationships. Our research model is summarized in Figure 1, which also summarizes the research hypotheses that are developed below.

[Insert Figure 1 about here]

**Aesthetics and Symbolism of Virtual Servicescapes and Customer Satisfaction**

Our first goal in this paper is to establish how the aesthetics of virtual servicescapes affects customer reactions. Aesthetics, as noted by Nasar (1988; 1994), Tractinsky and Zmiri (in press), and Rafaeli and Vilnai-Yavetz (2004b), deals with the sensory experience elicited by an artifact, and the extent to which this experience tallies with individual goals and attitudes. Aesthetics can be predicted to affect customer reactions because customers are likely to have expectations regarding the aesthetics of a virtual servicescape, and customer satisfaction is likely to result from the extent to which these expectations are met (Booms and Bitner 1981; Bitner 1990; 1992; Zeithaml, Berry, and Parasuraman 1993; 1996). Previous work has documented that customers expect to find aesthetic design in a service place, and are more satisfied when the design of a servicescape is aesthetic rather than unaesthetic (Nasar 1988; Hall and Hanna 2004; Tractinsky and Zmiri in press). Extending these findings to the context of virtual servicescapes, customers can be
predicted to be more satisfied by a virtual interaction that takes place in a more aesthetic virtual servicescape. Hence our first hypothesis:

**Hypothesis 1**: Customers will be more satisfied when service is offered in an aesthetic virtual servicescape than when the same service is offered in a less aesthetic virtual servicescape.

Support of Hypothesis 1 will be an important extension of previous work on aesthetics, because it will document the importance of aesthetics in situations where customers are experiencing the notion being judged (i.e., the servicescape) virtually rather than physically. Previous research on servicescapes has focused on the physical premises of an organization, while in virtual service the servicescape is experienced via a computer screen - potentially a completely different experience.

Our second goal in this paper is to explore the symbolism of virtual servicescapes as a dimension that influences customer reactions. Symbolism refers to the associations elicited by an artifact (Jones 1996; Pratt and Rafaeli 2001), and has been shown in previous research to be empirically separate in people's perceptions from aesthetics (Vilnai-Yavetz, Rafaeli, and Schneider-Yaakov 2005; Tractinsky and Zmiri in press). This suggests that a virtual servicescape can be perceived by customers as aesthetic or unaesthetic, and independently be perceived as symbolizing qualities such as friendliness, good service, high status or high prices.

We specifically examine the symbolism of professionalism elicited by a virtual servicescape, predicting that the extent to which a virtual servicescape symbolizes (i.e., elicits associations of) professionalism positively relates to customer satisfaction. As with aesthetics, this prediction is based on the assumption that customers expect professionalism in a servicescape (e.g., Serena, Lee-Chai, and Bargh 2001), and that customer satisfaction is determined by the degree to which these expectations are met (Bitner 1990; Zeithaml, Berry, and Parasuraman 1993; 1996). Hence our second hypothesis:
Hypothesis 2: Satisfaction will be greater when service is provided in a virtual servicescape perceived as more professional.

As with other factors that affect customer satisfaction, the aesthetics and professionalism of a virtual servicescape have implications for customers' willingness to (or approach rather than avoidance toward) continued business with a service provider (Russell and Mehrabian 1978; Pratt and Rafaeli 2001; Feng, Lazar, and Preece 2004). As documented by Dube, Chebat, and Morin (1995), the conditions that foster greater satisfaction are also likely to foster greater approach tendencies. Thus, as summarized in Figure 1, we predict a relationship between the aesthetics and professionalism of a virtual servicescape and customer approach toward the virtual service interaction:

Hypothesis 3: A more aesthetic virtual servicescape will create stronger approach toward a service interaction.

Hypothesis 4: A virtual servicescape judged as more professional will create stronger approach toward a service interaction.

Feelings of Pleasantness as Mediating the Relationship between Virtual Servicescape and Customer Reactions

When claiming that aesthetics and professionalism affect customer reactions toward a virtual servicescape, an important question is what psychological dynamics underlie these effects. Our next set of predictions suggests the key role of emotion, and specifically feelings of pleasantness (Mehrabian and Russell 1974; Russell and Pratt 1980), in this regard.

First, both aesthetics and professionalism can be predicted to directly evoke feelings of pleasantness – that is, agreeable or pleasing sensations. The aesthetics of physical settings has been shown to work in this manner (Nasar 1994; Strati 1999), with good aesthetics (operationally defined as beauty, tidiness and order) evoking feelings of pleasantness, and poor aesthetics (defined as ugliness, dirt, messiness or disorganization)
producing the opposite (Berlyne 1971; Gilboa and Rafaeli 2003). It has also been documented that customers’ interactions with virtual servicescapes influence their emotional responses (Novak, Hoffman, and Yung 2000; Mummalaneni 2005). We can therefore predict that an aesthetic virtual servicescape will be more pleasant to customers:

**Hypothesis 5:** Customer feelings of pleasantness will be higher in response to an aesthetic virtual servicescape than in response to a less aesthetic virtual servicescape.

An image of professionalism communicated by a virtual servicescape can likewise be predicted to inspire feelings of pleasantness. An impression of professionalism has been linked to pleasant feelings in physical settings (Rafaeli and Vilnai-Yavetz 2004b). In a virtual environment, Mummalaneni (2005) showed that a website design factor that can be viewed as symbolizing professionalism – based, among other items, on whether a design is well-organized, comfortable, and well-displayed – correlates with feelings of pleasantness. By extension, we predict similar reactions to the perceived professionalism of a virtual servicescape:

**Hypothesis 6:** Customer feelings of pleasantness will be higher when a virtual servicescape is perceived as communicating professionalism.

Our hypotheses thus far do not predict the role that emotional reactions to aesthetics and professionalism (and specifically feelings of pleasantness) play in predicting customer satisfaction or approach toward a service interaction. Yet building on available research on physical and virtual service, we can make such predictions. Customers' feelings of pleasantness were found to mediate the influence of the physical servicescape on their behavior (Donovan and Rossiter 1982; Babin and Darden 1995; Sherman, Mathur, and Smith 1997). Mummalaneni (2005) extended these findings to specific features of the virtual servicescape (such as size, attractiveness, type of display, and quality of signage) and documented the mediating effect of pleasantness on the relationship between website
characteristics and on-line shopping behaviors. Building on Nasar (1994), we expect a direct link between aesthetics and pleasantness. We also assume that greater feelings of pleasantness increase customer satisfaction and approach toward a service interaction (Dube, Chebat, and Morin 1995). Thus, we expect the relationship between the aesthetics of the virtual servicescape and customer reactions (satisfaction and approach toward a service interaction) to be mediated by customer feelings of pleasantness:

**Hypothesis 7**: Customer feelings of pleasantness will mediate the relationship between aesthetics of a virtual servicescape and customer reactions (satisfaction and approach toward a service interaction).

In contrast, we see no foundation for predicting emotion as a mediator between professionalism and customer reactions. Professionalism, as discussed earlier, is an association. It therefore represents a symbolic rather than a sensory notion, and symbolism relies on a cognitive rather than emotional process (Ornstein 1986; Frost and Morgan 1983; Jones 1996). Similar to other cognitive notions, professionalism may evoke emotions (Smith & Ellsworth, 1985; Rafaeli & Vilnai-Yavetz, 2004b). However there is no foundation to expect emotions to explain the effect of cognitive notions such as professionalism on other variables. Thus, we do not expect the relationship between the professionalism of a virtual servicescape and either customer satisfaction or approach toward a service interaction to be mediated by feelings of pleasantness:

**Hypothesis 8**: Customer feelings of pleasantness will not mediate the relationship between the professionalism communicated by a virtual servicescape and customer satisfaction or approach toward a service interaction.

In sum, the hypotheses of the study – as summarized in Figure 1 – suggest relationships between three sets of variables: (1) the aesthetics and professionalism of a virtual servicescape; (2) customer feelings of pleasantness; and (3) customer satisfaction with the service and approach toward a service interaction. The aesthetics and
professionalism of a virtual servicescape are predicted to influence customer satisfaction and customer approach toward a service interaction. Customer feelings of pleasantness are predicted to mediate the relationship between the aesthetics, but not the associated professionalism, of a virtual servicescape and customer reactions (satisfaction and approach toward a service interaction).

METHOD

Data were collected using an experimental, between-subjects design of 2 (levels of aesthetics) x 2 (levels of professionalism). Participants were told they had been recruited to evaluate a new method of service delivery through the Internet, and they were asked to help by offering their feedback on a demonstration of the new method. During the study, participants sat at PC terminals, through which they operated a program in which they viewed a service provider who instructed them on how to operate a product they had presumably purchased. At several points during the session the participants were asked by the service provider to use their mouse to click on various locations on their screen (they were required to do this for the program to continue). Participants assumed they were interacting with the service provider in real time through an Internet connection.

Four conditions created the experimental manipulation of the virtual servicescape. These conditions were identical in all respects, save for the aesthetics and professionalism of the physical setting that served as backdrop to the virtual encounter (Figure 2). In all conditions the same male service provider performed the same set of actions, while sitting at the same workstation; in each case the provider spoke directly to the observer (the study participant). Digital editing of the service provider's scripted behavior was integrated with programming in Visual Basic to produce the interactive features of the program. The approximate time of each virtual interaction was 1.5 minutes, with slight deviations due to variations in the speed with which participants responded to each stimulus. Thus,
participants experienced an interactive program that required their active participation to proceed, simulating a real e-service set-up while allowing complete experimental control over the study variables.

We chose this type of e-service program based on the findings of Basso et al. (2001), who studied shoppers' loyalty to an e-commerce website. Their results showed that real-time interactivity in a web interface, as compared with a standard web interface, made shoppers more likely to judge a salesperson trustworthy. The interactive condition of their study included features similar to ours, such as a TV-based application that allowed a salesperson to talk to the customer. The decreasing cost of transferring video images suggests that such a tool for offering service over the Internet will likely become feasible in the not-too-distant future. Figure 2 presents still images from the four experimental conditions.

[Insert Figure 2 about here]

**Participants**

Participants included 137 employees of various organizations (82 males and 55 females, aged 18-65), who participated in the study on a volunteer basis.

**Data Collection Process**

Participants were contacted by a research assistant and asked to help evaluate a new method for e-service. Following brief instructions, participants were randomly assigned to one of the four conditions. Each participant experienced only one experimental condition, for a between-subjects design. A set of structured questions appeared on the screen after all service interactions. Participants indicated their responses to these questions by clicking with a mouse.

**Independent Variables: Aesthetics and Professionalism of the Virtual Servicescape**

*Aesthetics of the virtual servicescape* included two levels. In the *high aesthetics* condition the service provider sat at a neat desk with a small vase of fresh flowers on it.
The *low aesthetics* condition featured a messy desk on which were scattered torn papers, coffee cups, and an ashtray filled with cigarette stubs.

*Professionalism of the virtual servicescape* also included two levels. In the *high professionalism* condition, a bulletin board behind the desk displayed Excel tables, graphs, and lists. In the *low professionalism* condition, the bulletin board showed stickers, cartoons, fast food menus, postcards, and children’s drawings.

**Dependent Variables**

*Customer feelings of pleasantness* were measured by an index of 3 items (using a 5-point Likert agreement scale, with 5 for "strongly agree" and 1 for "strongly disagree") adapted from Mehrabian and Russell (1974), and empirically supported by Russell and Pratt (1980): "I feel pleasant while looking at this office;" "The office gives me a pleasant feeling;" and "The office gives me a comfortable feeling" (Cronbach's Alpha = 0.87). The term "office" was intentionally used in these items to strengthen participants' belief that they were interacting with a real yet remote service provider.

*Satisfaction with virtual service* was measured via an index that integrated multiple approaches to customer satisfaction (Oliver, 1997; Szymanski & Henard, 2001). The index aggregated 4 single-item measures so that it captures overall satisfaction with the service, broadly defined (Szymanski & Henard, 2001). The index reflected the understanding of satisfaction as a broad construct that can comprise multiple perceptions, including that a service is needed in order to be satisfying, a sense that a service that meets one's needs promotes satisfaction, a general sense that one is satisfied with a service, and a sense that when satisfied one would recommend a service to others. The index therefore included the following 4 items (using a 5-point scale): perceived necessity of the service ("Do you think there is a need for such an e-service method?", with 5 for "certainly yes" and 1 for "certainly not"), intentions to use the service ("Would you use this e-service method when it becomes available?", with 5 for "certainly yes" and 1 for "certainly not"), overall
satisfaction with the service ("How satisfied are you with the way this method was applied?", with 5 for "highly satisfied" and 1 for "very unsatisfied"), and willingness to recommend the service to others ("Would you recommend this e-service method to any of your friends or family members?", with 5 for "certainly yes" and 1 for "certainly not") (Cronbach's Alpha=0.90).

**Customer approach toward the service interaction** was measured with a 3-item index (using a 5-point Likert agreement scale, with 5 for "strongly agree" and 1 for "strongly disagree") adapted from Russell and Mehrabian (1978): "I would like this employee to deal with all my e-service business;" "I would enjoy interacting online with this employee" and "I prefer that this employee not deal with my e-service business in the future" (reverse coded) (Cronbach's Alpha=0.81).

**Manipulation Check**

Two tests confirmed the validity of our manipulation. First, a pilot study with a set of participants (n=30) unrelated to the study sample verified that participants saw no difference between the four conditions in regard to the performance of the service provider. However, when these participants rated the professionalism and aesthetics of the virtual service setting they encountered (using a 5-point Likert scale, see Table 1), their ratings confirmed the two levels of the (independent) design variables (high aesthetics: 3.4, low aesthetics: 1.9, t_{(135)}=2.8, p<0.01; high professionalism: 2.5, low professionalism: 1.9, t_{(135)}=2.2, p<0.05).

Second, study participants were asked to rate the aesthetics and professionalism of the virtual service setting they encountered (using a 5-point Likert agreement scale, with 5 for "strongly agree" and 1 for "strongly disagree") on two items that measured aesthetics ("this office is very beautiful" and "this office is ugly" (reverse coded), Cronbach’s alpha=0.64); and four that measured professionalism ("the offices of employees in this firm show the high professionalism of the firm", "this office shows that there is a strict policy in this company regarding employees", "this office shows that the company in which he works is very
professional", and "judging from this office it is reasonable that there are clear and well
defined policies in this firm", Cronbach’s alpha=0.86), as summarized in Table 1.

As expected, aesthetics was rated significantly higher in the condition experimentally
designed as higher aesthetics than in the condition designed as lower aesthetics (3.3 versus
2.7) ($t_{(135)}= 2.8, p<0.01$), and professionalism was rated significantly higher in the condition
experimentally designed to appear more professional than in the condition designed to
appear less professional (2.7 as compared to 2.3) ($t_{(135)}=2.9, p<0.01$). Thus, participant
perceptions of aesthetics and professionalism confirmed the experimental manipulation had
worked.

Our method, therefore, allowed for a complete and accurate manipulation of the virtual
servicescape, while maintaining experimental accuracy and capturing the situation from the
customer's point of view (Echeverri 2000). Following Bateson and Hui (1992), the
psychological effects of our method can be assumed to be similar to the effects of real-life e-
service interactions, while the internal validity of the study is ensured.

**Construct validity of study variables**

Confirmatory as well as Exploratory factor analyses (EFA and CFA) established the
construct validity of our variables. As shown in Table 1, perceptions of the virtual
servicescape included two factors - the independent variables, with Factor 1 representing
perceived professionalism and Factor 2 corresponding to perceived aesthetics. Results of
EFA Promax oblique rotation revealed this factor pattern, with a correlation between the
factors of .44. The various fit measures for the CFA were largely satisfactory and the
interfactor correlation in the CFA was .64. Thus, both EFA and CFA supported the
theoretical structure of the research variables.

As seen in Table 2, participants’ reactions included three distinct factors – the
mediating and dependent variables, with Factor 1 representing customer satisfaction, Factor
2 representing feelings of pleasantness, and Factor 3 corresponding to approach toward a
service interaction. The strong loadings of the variables’ items on their corresponding factors (in both EFA and CFA) support the validity of the variables. Results of EFA Promax oblique rotation revealed this factor pattern, with a correlation between the factors ranging from .52 to .58. The various fit measures for the CFA are also good. The interfactor correlations between pairs of variables in the CFA ranged from .52 to .76. Thus, both EFA and CFA supported the theoretically presumed structure of the research variables. Table 3 presents means, standard deviations and inter-correlations of the dependent variables.

[Insert Tables 1, 2 and 3 about here]

RESULTS

We first tested our predictions using the experimental conditions as independent variables. As elaborated below, these analyses confirmed most, but not all, of our hypotheses. A second test, using participants' perceptions of aesthetics and professionalism as independent variables, confirmed all the research hypotheses.

Customer Satisfaction and Approach toward a Service Interaction

Supporting Hypothesis 1, customer satisfaction was significantly higher with a more aesthetic than with a less aesthetic virtual servicescape (3.4 as compared to 2.8, \( F_{1,135} = 13.04, p< 0.001 \)). In support of Hypothesis 2, satisfaction was also higher with a more than with a less professional virtual servicescape (3.3 versus 2.9, \( F_{1,135} = 6.72, p< 0.01 \)). Hypothesis 3 was also supported, since reported approach toward a service interaction was significantly higher among participants who experienced a more rather than a less aesthetic virtual servicescape (3.4 as compared to 2.9, \( F_{1,135} = 7.41, p< 0.01 \)). However, Hypothesis 4 was not supported, since professionalism of the virtual servicescape had no effect on customer approach toward a service interaction. The interaction between aesthetics and professionalism had no significant effect on the analyses (see Table 4).
Feelings of Pleasantness and Qualities of the Virtual Servicescape

As predicted by Hypothesis 5, customer feelings of pleasantness were significantly higher when the experienced virtual servicescape was more aesthetic than when it was less aesthetics (3.1 versus 2.4, F(1,135) = 14.43, p< 0.001). However, Hypothesis 6 was not supported, as there was no significant difference between the two conditions of professionalism in reported feelings of pleasantness. The interaction between aesthetics and professionalism did not have a significant effect on reported pleasantness. (See Table 4).

Hypotheses 7 and 8, as depicted in Figure 1, suggested feelings of pleasantness as the mediator between aesthetics of the virtual servicescape, but not professionalism, and participant reactions (satisfaction and approach toward a service interaction). As summarized in Tables 5 and 6, we followed Baron and Kenny's (1986) recommendations to test the mediation predictions.

First - Stage 1 in Tables 5 and 6 - we verified that the mediator (feelings of pleasantness) was predicted by the two independent variables (aesthetics and professionalism). Second – Stage 2 in Tables 5 and 6 - we explored whether the dependent variables (satisfaction and approach toward a service interaction) were predicted by the independent variables. Third – Stage 3 in Tables 5 and 6 - we examined what happened when the predicted mediator (pleasantness) was added to the independent variables (aesthetics and professionalism) and both were entered as predictors of the respective dependent variables.

These analyses confirmed that, as predicted by Hypothesis 7, feelings of pleasantness mediated the relationship between aesthetics of the virtual servicescape and customer satisfaction. A significant relationship was found between aesthetics and feelings of pleasantness (the mediator) in Stage 1 (Beta = 0.31, p<0.001). Stages 2 and 3 suggested partial mediation since, as evident in Table 5, the relationship between aesthetics and
satisfaction was significant in Stage 2 (Beta = 0.29, p>0.001), and remained significant but became weaker in Stage 3 (Beta = 0.16, p<0.05), where pleasantness was highly related to satisfaction (Beta= 0.42, p < 0.001). Thus, pleasantness was shown to explain some but not all of the variance in satisfaction explained by aesthetics.

[Insert Table 5 about here]

These analyses also confirmed that – as predicted by Hypothesis 8 - pleasantness did not mediate the relationship between professionalism as symbolized by the virtual servicescape and customer satisfaction. As can be seen in Table 5, the relationship between professionalism and feelings of pleasantness was not significant in Stage 1, and an insignificant change occurred between Stages 2 and 3, in the relationship between professionalism and satisfaction, after pleasantness was included in the regression equation.

The pattern is similar with regard to the relationship between aesthetics and professionalism and approach toward a service interaction. Consistent with Hypothesis 7, feelings of pleasantness fully mediated the relationship between aesthetics and customer approach toward a service interaction. The mediation is evident in Table 6. As this table shows, in Stage 1 we found a significant relationship between aesthetics and pleasantness (the mediator) (Beta = 0.31, p<0.001). At the same time, the relationship between aesthetics and approach toward a service interaction is significant in Stage 2 (Beta = 0.23, p<0.01), but becomes non-significant in Stage 3 (when pleasantness is included in the regression), where the effect of pleasantness is significant (Beta= 0.60, p <0.001).

Here as well, as also predicted by Hypothesis 8, feelings of pleasantness did not mediate the relationship between professionalism and approach toward a service interaction. The relationship between professionalism and pleasantness (the mediator) was not significant in Stage 1, and there was no relationship between professionalism and approach toward a service interaction either before or after pleasantness was added to the regression equation (Table 6).
Customer Perceptions of Qualities of the Virtual Servicescape as Independent Variables

Our data allowed for two complementary sets of analyses. Our primary focus – as described above – concerned participant reactions to the experimental conditions of aesthetics and professionalism. These analyses make an unambiguous statement about causality because they rule out effects of same-method variance, since the experimental conditions are the independent variables and these were externally defined and imposed upon the participant (Campbell and Stanley 1966). Testing our hypotheses using the experimental conditions as independent variables confirmed 4 of the first 6 hypotheses, but left 2 hypotheses unsupported.

A second mode of data analysis was afforded by participants' perceptions of the aesthetics and professionalism of the virtual servicescapes. These perceptions could also be considered as predictors of pleasantness, satisfaction and approach toward a service interaction (Hypotheses 1-6). These analyses run the risk of same-method variance, since in each case both the independent variables (aesthetics and professionalism) and the dependent variables (feelings of pleasantness, satisfaction, and approach) came from the same participants. However, these analyses offer additional insight into the issues at hand in that they explore our hypotheses through participants' subjective perceptions.

In this second set of analyses, when the independent variables were participants' perceptions of aesthetics and professionalism rather than the experimental manipulations, all first 6 hypotheses were confirmed. Virtual servicescape perceptions were significant predictors of satisfaction (aesthetics: Beta=0.31, p<0.001; professionalism: Beta=0.27, p<0.01) and of approach toward a service interaction (aesthetics: Beta=0.34, p<0.001; professionalism: Beta=0.29, p<0.01), supporting Hypotheses 1 to 4 (Table 7). Similarly, both perceived aesthetics and perceived professionalism were found to be significant
predictors of feelings of pleasantness (aesthetics: \( \text{Beta}=0.58, p<0.001 \); professionalism: \( \text{Beta}=0.28, p<0.01 \)). Thus, Hypotheses 5 and 6 were also supported, as summarized in Table 7.

A final set of mediation analyses examined Hypotheses 7 and 8 using perceived aesthetics and professionalism. These analyses fully supported Hypothesis 7 and as before confirmed that feelings of pleasantness mediated the relationship between aesthetics of the virtual servicescape and customer satisfaction, as well as the relationship between aesthetics and customer approach toward a service interaction. A significant relationship was found between aesthetics and feelings of pleasantness (the mediator) in Stage 1 of both analyses (\( \text{Beta} = 0.58, p<0.001 \)). In stage 2 the relationship between aesthetics and customer satisfaction as well as the relationship between aesthetics and approach toward a service interaction was significant (for customer satisfaction: \( \text{Beta} = 0.31, p<0.001 \); for approach toward a service interaction: \( \text{Beta} = 0.34, p<0.001 \)). Both relationships become non-significant in Stage 3 (when pleasantness was included in the regression), while the effect of pleasantness was significant (effect on customer satisfaction: \( \text{Beta} = 0.26, p<0.05 \); effect on approach toward a service interaction: \( \text{Beta} = 0.50, p<0.001 \)).

With regards to Hypothesis 8 the results were somewhat different from those observed with the experimentally manipulated professionalism. Feelings of pleasantness partially mediated between professionalism and satisfaction (stage 1 - effect on pleasantness: \( \text{Beta} = 0.28, p<0.001 \); stage 2 - effect on satisfaction: \( \text{Beta} = 0.27, p<0.001 \); stage 3 - effect on satisfaction: \( \text{Beta} = 0.20, p<0.05 \), effect of pleasantness on satisfaction: \( \text{Beta} = 0.26, p<0.05 \)). Feelings of pleasantness also partially mediated between professionalism and approach toward a service interaction (stage 1 - effect on pleasantness: \( \text{Beta} = 0.28, p<0.001 \); stage 2 - effect on approach toward a service interaction: \( \text{Beta} = 0.29, p<0.001 \); stage 3 - effect on approach toward a service interaction: \( \text{Beta} = 0.16, p<0.05 \), effect of pleasantness
on approach toward a service interaction: Beta = 0.50, p<0.001). These unexpected partial mediation effects seem attributable to the fact that these analyses rely on same source data, since all variables in the analyses reflect participants' self-report.

Overall, our findings support our theoretical framework, as depicted in Figure 1, documenting the effects of aesthetics and professionalism on various customer reactions, and illustrating the importance of distinguishing between these two distinct aspects of a virtual servicescape in influencing customers.

**DISCUSSION**

Our findings suggest that certain aspects of the virtual servicescape influence customer reactions to service delivered through virtual means. The aesthetics of the virtual servicescape were found to influence customer feelings of pleasantness, satisfaction with the service, and approach toward a service interaction. In our experimental manipulation, the professionalism of the virtual servicescape was found to influence customer satisfaction, but not feelings of pleasantness or approach toward service interaction. However, when viewed through the prism of participants' perceptions, professionalism did influence these variables, suggesting that professionalism does evoke emotion and that people do associate professionalism with their approach toward a service interaction.

Our findings also reveal the important role played by feelings of pleasantness in mediating the relationship between virtual servicescapes and both customer satisfaction and customer approach toward a service interaction, thus supporting previous research documenting the mediating effects of pleasantness in physical as well as virtual settings (Donovan and Rossiter 1982; Babin and Darden 1995; Sherman, Mathur, and Smith 1997; Mummalaneni 2005). These results affirm the centrality of emotion as a key variable in explaining customer reactions to different aspects of service. Customer feelings of
pleasantness were shown to clearly and powerfully mediate the relationship between the aesthetics of the virtual servicescape and customer approach toward a service interaction. In addition, customer feelings of pleasantness were shown to partially mediate the relationship between the aesthetics of the virtual servicescape and customer satisfaction. Using perceived aesthetics it was found that pleasantness fully mediates the relationship between the aesthetics of the virtual servicescape and customer approach toward a service interaction as well as the relationship between the aesthetics and customer satisfaction.

It thus appears that while the pleasant sensations aroused by aesthetics certainly help to produce satisfied customers, other dynamics are also at play here. These results are important because they suggest a distinction between the emotion – pleasantness – and the reaction – satisfaction, two concepts that are often considered identical. Further research is required to unravel the additional dynamics involved.

The results further clarify when emotion is likely to serve as a key explanatory variable. Customer feelings of pleasantness were not found to mediate the relationship between the professionalism communicated by a virtual servicescape and either customer satisfaction or approach toward a service interaction. With regards to customer perceptions of professionalism, feelings of pleasantness partially mediated between professionalism and satisfaction as well as approach toward a service interaction. We suggest that these unexpected partial mediation effects are attributable to the fact that these analyses rely on same source data, since all variables in the analyses reflect participants' self-report. In any case, however, consistent with Nasar (1994) and others, we find that while emotion does mediate the effects of aesthetics on customer reactions, it does not do the same for professionalism. Professionalism is a symbolic interpretation of an observed artifact, and as such involves cognitive as well as emotional processes (Nasar 1994; Rafaeli and Vilnai-Yavetz 2004a). Such symbolic interpretations are complex (Cohen 1976; Jones 1996) and difficult to predict.
In systematically assessing reactions to virtual servicescapes, this study draws a connection between Bitner's (1992) ideas regarding the effects of servicescapes on customer reactions and the current trend toward alternative types of service interactions, especially electronic or virtual interactions (Rust and Kannan 2002). Reports concerning physical environments are beginning to confirm the separate and simultaneous effects of functionality, aesthetics and symbolism of such environments (Strati 1992; Rafaeli and Vilnai-Yavetz 2004b). Our findings extend this work, showing that virtual environments, no less than physical ones, should be considered in light of aesthetics as a dimension separate from symbolism, thus enriching our ability to predict the reactions of customers. Our study thus adds an important dimension, symbolism, to previous work on aesthetics (Hall and Hanna 2004; Lavie and Tractinsky 2004) and functionality (Nielsen 2000; Hong, Tam, and Yim 2002) in an e-service context, which have been highlighted elsewhere.

Our findings suggest that the effects of aesthetics are stronger and more straightforward than the effects of symbolism. These are important findings, because they further elevate the importance of aesthetics in service management. Aesthetics appears to be a major factor in producing top-quality service that deserves both research and managerial attention.

A close look at our findings reveals a paradox of sorts. On the one hand, individuals' perceptions of professionalism were found to influence their feelings of pleasantness and approach tendencies. On the other, 'objective' professionalism, determined by our experimental design, did not have a significant effect on these reactions. We believe that this paradox should not be viewed as negating the importance of symbolism. On the contrary, our findings most likely reflect the greater complexity of symbolism (Cohen 1976; Jones 1996), where professionalism is but one association that can be drawn from the appearance of a service site. Other associations may produce different customer responses, which may mask or confound the effects of professionalism. For instance, the virtual servicescape we
studied – in which the more "professional" setting was deliberately designed to look formal, because of a presumed association between formality and professionalism – may elicit in some people the association of conservatism, rather than professionalism. This alternative association might alienate some customers and make them less likely to want to engage in service interactions with this organization.

An additional consideration in this regard is that our study participants were Israelis, who are known to hold ambivalent attitudes toward formality (Schwartz 1999; Hofstede 2001; Vilnai-Yavetz, Rafaeli, and Ramati 2004). Such ambivalence may color reactions to a highly professional setup, such as the one we studied, in a unique fashion: The conflict between two forces may have attenuated the effects of professionalism on consumer reactions: On the one hand, some of our participants may have appreciated the professionalism, which would have improved their attitude toward the more professional set-up. On the other hand, other participants may have been turned-off by the greater formality. These cultural dynamics may have colored our participants' reactions to the formal, "professional" setting and contaminated our findings. Replicating our study in other cultures would enable us to assess the implications of culture on attitudes toward professionalism in the design of e-service and virtual servicescapes (Hall and Hall 1990; Hofstede 2001).

One interesting question that our study could not address, but which is worthy of exploration, concerns the potential effects of a virtual servicescape at different junctures of an interaction between a customer and an organization. The classic idea of the 'moment of truth' in service delivery (Gronroos 1990) takes on completely new meaning when it comes to e-service or service interactions conducted through 'clicks' rather than with 'bricks' (Browne, Durrett, and Wetherbe 2004). In the case of physical service environments, initial 'first-impression' effects of the servicescape have been documented (Morrow and McElroy 1981; Baron 1994; Sherman, Mathur, and Smith 1997; Scholder-Ellen and Fitzgerald-Bone
1998), as well as continuous effects over the course of a more prolonged interaction (Donovan and Rossiter 1982; Oldham 1988; Bitner 1992; Babin and Darden 1995; Dube, Chebat, and Morin 1995; Oldham, Cummings, and Zhou 1995). In the case of e-service, the first-impression effects are most critical because the costs for a customer of transfer from one setting to another are much lower. Our study documents these first-impression effects on reported tendencies. The 1.5-minute duration of the virtual interaction in our study is longer than the few seconds within which first impressions of a web site are created, but falls clearly within the realm of initial exposure or first impressions.

**Managerial Implications**

The idea of e-service is of great interest to service organizations because of its advantages over physical service in terms of lower costs and easier access to customers. However, it remains an open question whether customers prefer the personal, human touch of classic service interactions over impersonal, 'clicks only' service. Thus far, advocates of both arguments can find support in the literature. For instance, Steinbruck et al. (2002) found that including photographs of customer service agents in an e-bank's website made customers more likely to express trust in the site. Similarly, Basso et al. (2001) showed that interacting with a salesperson in real time made customers more likely to judge the salesperson as friendly and trustworthy. On the other hand, it has been argued that social and affective cues, such as photos, can be a risky strategy if the photos are not perceived as functional (Riegelsberger and Sasse 2002). Jeandrain (2001) showed that consumer reactions to the design of a virtual shop are not uniform, and depend primarily on individual buying styles: People who regard shopping as recreation seem to prefer shopping in a realistic virtual shop, while those who consider shopping a task prefer the convenience of physical stores. Our study begins to connect these findings by exploring what happens when service is delivered through personal interaction in a virtual rather than physical setting. A classic extension of our study, which could further clarify this complex issue, would involve
comparing our setup to a web site featuring all the text heard by our participants, but without the personal touch afforded by the human actor.

Assuming customer preferences for a personalized interaction (Basso et al. 2001; Steinbruck et al. 2002), the setup we used could conceivably become a standard service procedure. For example, in cellular phone customer service, call center staff provide service either by phone or over the Internet; the latter, while faster and less expensive for organizations, is far less popular with customers, most likely because of the absence of personal contact. Moreover, the lack of visual interface with customers may create alienation among call center employees. The service procedure we suggest, Internet service with visual interface, might be a way to improve quality of service while lowering costs, as suggested by Hallowell (2002a; 2002b).

The bottom line of our study is that a virtual servicescape, no less than a physical one, can have strong effects on customer emotions, customer satisfaction, and customer approach toward a service interaction. Thus, the managerial attention to servicescapes recommended by Bitner (1992) must not be forgotten in the design of virtual-service delivery, with special attention given to the aesthetics and symbolism of such designs.
REFERENCES


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ABOUT THE AUTHORS

Iris Vilnai-Yavetz received her PhD in management from the Technion, Israel’s Institute of Technology in Haifa, and her BA in Psychology and her MBA from the Hebrew University of Jerusalem. Before her graduate studies Iris worked as a marketing consultant and is now an adjunct lecturer at the Technion Graduate School of Business and at the Haifa University Graduate School of Business. Her current studies examine the impact of physical environments on emotions and behaviors of customers and service providers, and on their social and business interactions. She also studies various aspects of the design of E-services.

Anat Rafaeli received her PhD in Industrial and Organizational Psychology from the Ohio State University. She is currently a Professor of Organizational Behavior and the Academic Director of the MBA program of the Faculty of Industrial Engineering and Management of the Technion, Israel’s Institute of Technology. Anat has conducted and published research on felt and displayed emotion in organizations, various aspects of interactions between customers and employees and organizational artifacts, including employee dress, organizational servicescapes, waiting queues, and employment ads. Her new book, co-edited with Mike Pratt is entitled "Artifacts and Organizations" and published by Lawrence Erlbaum. She is on the Editorial Board of Organization Science, the Journal of Service Research, and the International Journal of Service Industry Management. She has published in outlets such as Academy of Management Journal and Academy of Management Review, Journal of Applied Psychology and Research in Organizational Behavior.
Figure 1

Predicted relationships between aesthetics and professionalism of a virtual servicescape, customer feelings of pleasantness, customer satisfaction, and customer approach toward a service interaction.1

1 The lines that show the relationships between aesthetics and the mediator and DVs are complete (non-broken) lines; the lines that show the relationships between professionalism and the mediator and DVs are broken lines.
Figure 2

Still images of one point in time in the four experimental conditions of the interactive program.² Images on the top row are high aesthetics and on the bottom row are low aesthetics. Moving from left to right images move from informal to formal conditions.

²
Table 1
EFA and CFA results for the perceptions of virtual service environment
(Independent variables)

<table>
<thead>
<tr>
<th>Survey items</th>
<th>EFA loadings¹,²</th>
<th>CFA loadings</th>
<th>t-value⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>This office is very beautiful</td>
<td>0.600</td>
<td>0.783</td>
<td>0.93</td>
</tr>
<tr>
<td>This office is ugly (Reverse coded)</td>
<td>0.186</td>
<td>0.890</td>
<td>0.52</td>
</tr>
<tr>
<td>The offices of employees in this firm show the high professionalism of the firm.</td>
<td>0.742</td>
<td>0.652</td>
<td>0.57</td>
</tr>
<tr>
<td>This office shows that there is a strict policy in this company regarding employees</td>
<td>0.864</td>
<td>0.483</td>
<td>0.91</td>
</tr>
<tr>
<td>This office shows that the company in which he works is very professional</td>
<td>0.823</td>
<td>0.190</td>
<td>0.61</td>
</tr>
<tr>
<td>Judging from this office it is reasonable that there are clear and well defined policies in this firm</td>
<td>0.897</td>
<td>0.339</td>
<td>0.80</td>
</tr>
</tbody>
</table>

Goodness of Fit statistics:
Chi-Square= 15.15; DF=6; p<.05
CFI=.97
GFI=.92
SRMR=.04
RMSEA=.09

Note: EFA: Exploratory Factor Analysis; CFA: Confirmatory Factor Analysis; CFI: Comparative Fit Index; GFI: Goodness of Fit Index; SRMR: Standardized Root Mean Residual; RMSEA: Root Mean Square Error of Approximation.

¹ EFA: Marked cells indicate items with high loading on factor.
² EFA: Total variance extracted by the two factors=75.1%. Rotation method: Promax ; Eigenvalues > 1.0
⁵ CFA: Based on one-tailed tests all t-values are significant at p<.05
### Table 2

**EFA and CFA results for the participants’ responses (Dependent variables)**

<table>
<thead>
<tr>
<th>Survey items</th>
<th>EFA loadings6,7</th>
<th>CFA loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 Satisfaction</td>
<td>2 Feelings of pleasantness</td>
</tr>
<tr>
<td>I would like this employee to deal with all my e-service business</td>
<td>0.542</td>
<td>0.744</td>
</tr>
<tr>
<td>I would enjoy interacting online with this employee</td>
<td>0.579</td>
<td>0.756</td>
</tr>
<tr>
<td>I prefer that this employee will not deal with my e-service business in the future (reverse coded)</td>
<td>0.360</td>
<td>0.325</td>
</tr>
<tr>
<td>Do you think there is a need for such an e-service method?</td>
<td>0.915</td>
<td>0.332</td>
</tr>
<tr>
<td>How satisfied are you with the way this method was applied?</td>
<td>0.765</td>
<td>0.581</td>
</tr>
<tr>
<td>Would you use this e-service method when it becomes available?</td>
<td>0.939</td>
<td>0.529</td>
</tr>
<tr>
<td>Would you recommend this e-service method to any of your friends or family members?</td>
<td>0.892</td>
<td>0.455</td>
</tr>
<tr>
<td>I feel pleasant while looking at this office</td>
<td>0.449</td>
<td>0.882</td>
</tr>
<tr>
<td>The office gives me a pleasant feeling</td>
<td>0.375</td>
<td>0.879</td>
</tr>
<tr>
<td>The office gives me a comfortable feeling</td>
<td>0.430</td>
<td>0.866</td>
</tr>
</tbody>
</table>

Goodness of Fit statistics:
- Chi-Square=62.63; DF=32; p<.001
- CFI=.97
- GFI=.92
- SRMR=.06
- RMSEA=.08

Note: EFA: Exploratory Factor Analysis; CFA: Confirmatory Factor Analysis; CFI: Comparative Fit Index; GFI: Goodness of Fit Index; SRMR: Standardized Root Mean Residual; RMSEA: Root Mean Square Error of Approximation.
6 EFA: Marked cells indicate items with high loading on factor.
7 EFA: Total variance extracted by the three factors=79.4% . Rotation method: Promax; Eigenvalues > 1.0
8 CFA: Based on one-tailed tests all t-values are significant at p<.01
Table 3
Means, standard deviations and intercorrelations of study dependent variables
(n=137)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean (1-5)</th>
<th>SD</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Customer feelings of pleasantness</td>
<td>2.7</td>
<td>1.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Approach toward service interaction</td>
<td>3.2</td>
<td>1.04</td>
<td>0.62**</td>
<td></td>
</tr>
<tr>
<td>3. Satisfaction with virtual service</td>
<td>3.1</td>
<td>0.90</td>
<td>0.48**</td>
<td>0.58**</td>
</tr>
</tbody>
</table>

** p<0.01
Table 4

GLM results of *aesthetics* and *professionalism* of a virtual servicescape as predictors of customers’ satisfaction, approach toward a service interaction, and feelings of pleasantness (n=137)

<table>
<thead>
<tr>
<th></th>
<th>Satisfaction with virtual service (1-5)</th>
<th>Approach toward a service interaction (1-5)</th>
<th>Customer feelings of pleasantness (1-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Means</td>
<td>F</td>
<td>Means</td>
</tr>
<tr>
<td>Aesthetics High</td>
<td>3.4</td>
<td>13.04***</td>
<td>3.4</td>
</tr>
<tr>
<td>Low</td>
<td>2.8</td>
<td></td>
<td>2.9</td>
</tr>
<tr>
<td>Professionalism High</td>
<td>3.3</td>
<td>6.72*</td>
<td>3.2</td>
</tr>
<tr>
<td>Low</td>
<td>2.9</td>
<td></td>
<td>3.1</td>
</tr>
<tr>
<td>Aesthetics*Professionalism</td>
<td>0.26</td>
<td>0.11</td>
<td>0.01</td>
</tr>
<tr>
<td>R²</td>
<td>0.13</td>
<td></td>
<td>0.06</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.12</td>
<td></td>
<td>0.04</td>
</tr>
</tbody>
</table>

* p<0.05
** p<0.01
*** p<0.001
Table 5
Regression analyses of Feelings of pleasantness as mediator of relationship between aesthetics and professionalism of virtual servicescape and customer satisfaction (n=137)

<table>
<thead>
<tr>
<th>Variables entered</th>
<th>Stage 1: DV = Pleasantness</th>
<th>Stage 2: DV = Satisfaction</th>
<th>Stage 3: DV = Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetics</td>
<td>0.31***</td>
<td>0.29***</td>
<td>0.16*</td>
</tr>
<tr>
<td>Professionalism</td>
<td>0.09</td>
<td>0.21**</td>
<td>0.17*</td>
</tr>
<tr>
<td>Pleasantness</td>
<td></td>
<td></td>
<td>0.42***</td>
</tr>
</tbody>
</table>

R² = .11  R² = .13  R² = .29
Adjusted R² = .09  Adjusted R² = .12  Adjusted R² = .27

*p ≤ 0.05

**p ≤ 0.01

***p<0.001
Table 6
Regression analyses of feelings of pleasantness as a mediator of the relationship between aesthetics and professionalism of the virtual servicescape and customer approach toward a service interaction (n=137)

<table>
<thead>
<tr>
<th>Variables entered</th>
<th>Beta</th>
<th>Stage 1:</th>
<th>Stage 2:</th>
<th>Stage 3:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>DV = Pleasantness</td>
<td>DV = Approach</td>
<td>DV = Approach</td>
</tr>
<tr>
<td>Aesthetics</td>
<td>0.31***</td>
<td>0.23**</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Professionalism</td>
<td>0.09</td>
<td>0.08</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Pleasantness</td>
<td></td>
<td>0.60***</td>
<td>R² = .11</td>
<td>R² = .06</td>
</tr>
</tbody>
</table>

Adjusted R² = .09 Adjusted R² = .05 Adjusted R² = .37

**p ≤ 0.01

***p<0.001
Table 7

Regression analyses of perceived aesthetics and perceived professionalism of the virtual servicescape as predictors of customers’ satisfaction, feelings of pleasantness and approach toward a virtual interaction (n=137)

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Beta</th>
<th>Beta</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Satisfaction</td>
<td>Approach toward a service interaction</td>
<td>Pleasantness</td>
</tr>
<tr>
<td>Perceived aesthetics</td>
<td>0.31***</td>
<td>0.34***</td>
<td>0.58***</td>
</tr>
<tr>
<td>Perceived professionalism</td>
<td>0.27**</td>
<td>0.29**</td>
<td>0.28**</td>
</tr>
</tbody>
</table>

*R2 = .25*  
*Adjusted R² = .24*

*R2 = .29*  
*Adjusted R² = .28*

*R2 = .57*  
*Adjusted R² = .56*

**p ≤ 0.01

***p<0.001